

Chapter 5

Troubleshooting

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5.1 Troubleshooting Guidelines

This section describes how to identify and troubleshoot problems to repair the printer either to the unit/assembly level or to the component level. When replacing or repairing units or assemblies, follow the flowchart for that assembly or unit, which enables you to isolate the problem easily, based on the symptom. To repair to the component level, see sections 5.3 and 5.4, which provide checkpoints listed separately for major electric parts.

This section provides information on the error modes displayed on the control panel and check lists used to determine if the units in each assembly are normally functioning.

5.1.1 Error Mode

The LEDs on the control panel identify a number of abnormal conditions for this printer. Table 5-1 lists the printer errors and corresponding LED status. (See Figure 5-1 for the arrangement of LEDs.)

Table 5-1. Printer Error Status

Printer status	LED (a)	LED (b)	LED (c)	LED (d)
Initial ink charge sequence is proceeding.	Blinks	—	—	—
Ink cartridge change sequence is proceeding.	Blinks	—	—	—
Paper out.	—	On	—	—
Paper jam.	—	Blinks	—	—
Black ink cartridge ink end; No black ink cartridge installed.	—	—	On	—
Black ink cartridge ink low.	—	—	Blinks	—
Color ink cartridge ink end; No color ink cartridge installed.	—	—	—	On
Color ink cartridge ink low.	—	—	—	Blinks
Maintenance required. (Waste ink pads need replacing.)	Blinks	Blinks	Blinks	Blinks
Fatal error.	Blinks	Blinks	On	On

Note: “—” means no effect.

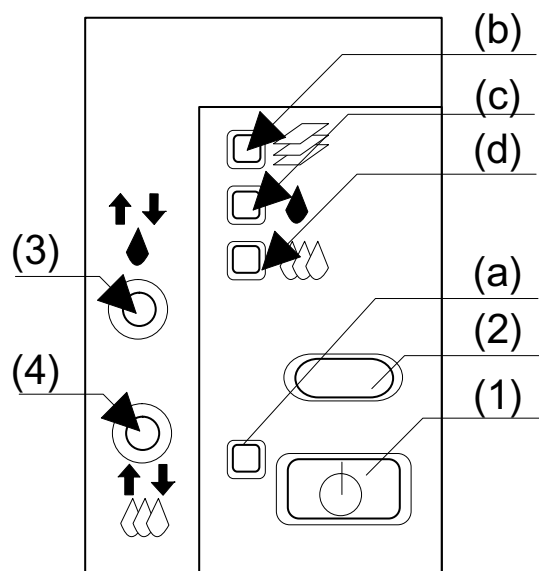


Figure 5-1. Control Panel

5.1.2 Sensor Checkpoints

Table 5-2 shows the checkpoints for each sensor.

Table 5-2. Checkpoints for Each Sensor

Sensor CN no.	Test pin no.	Test procedure (Set meter to DC voltage.)	Meter reading
CN6 (HP sensor)	1: HP 2: GND 3: HPV	Place the "+" lead of the meter on pin 1 and "-" lead of the meter on pin 2.	HIGH at home position (5 V). LOW at other positions (GND).
CN7 (ASF HP sensor)	1: ASF 2: GND 3: ASFV	Place the "+" lead of the meter on pin 1 and "-" lead of the meter on pin 2.	LOW at home position. HIGH at other positions.
CN8 (PE sensor)	1: PE 2: GND 3: PEV	Place the "+" lead of the meter on pin 1 and "-" lead of the meter on pin 2.	LOW when paper is loaded. HIGH when no paper is loaded.
CN9 (Black cartridge detecting sensor)	1: BCO 3: GND	Place the "+" lead of the meter on pin 1 and "-" lead of the meter on pin 3.	LOW when cartridge is installed. HIGH when cartridge is not installed.
CN10 (Color cartridge detecting sensor)	1: CCO 3: GND	Place the "+" lead of the meter on pin 1 and "-" lead of the meter on pin 3.	LOW when cartridge is installed. HIGH when cartridge is not installed.
Printhead thermistor (on color head)			10K $\Omega \pm 10\%$ at 77° F (25° C)

5.1.3 Motor Checkpoints

Table 5-3 shows the checkpoints for each motor.

Table 5-3. Coil Resistance for Each Motor and Check Procedure

Sensor CN no.	Test pin no.	Test procedure (Set meter to Ω .)	Meter reading
CN11 (ASF/Pump motor)	1: ASFA 2: ASF-A 3: ASFB 4: ASF-B	Place one lead of the meter on pin 1 and the other lead on pin 3. Place one lead of the meter on pin 2 and the other lead on pin 4.	9.3 $\Omega \pm 10\%$ at 25 °C (77 °F) /each phase
CN12 (CR Motor)	1: CRA 2: CR-A 3: CRB 4: CR-B	Place one lead of the meter on pin 1 and the other lead on pin 3. Place one lead of the meter on pin 2 and the other lead on pin 4.	7.8 $\Omega \pm 10\%$ at 25 °C (77 °F) /each phase
CN13 (PF motor)	1: PFA 2: PF-A 3: PFB 4: PF-B	Place one lead of the meter on pin 1 and the other lead on pin 3. Place one lead of the meter on pin 2 and the other lead on pin 4.	5 $\Omega \pm 10\%$ at 25 °C (77 °F) /each phase

5.2 Repair and Replacement of Unit Parts

This section contains flowcharts that let you isolate faulty units by following the flowchart for the problem. You can identify the faulty unit based on the primary symptom listed in Table 5-4. Refer to sections 5.3, 5.4, and 5.5 for information on repair to the component level for the PSB/PSE board, MAIN board, and the printer mechanism.

Table 5-4. Symptoms and Corresponding Flowcharts

Symptom	Cause	Flowchart
The printer does not operate at all.	<input type="checkbox"/> No LED goes on. <input type="checkbox"/> LED goes on but the printer mechanism does not operate at all.	1
CR moves abnormally.	<input type="checkbox"/> When the printer is powered on, the CR leaves home position and a fatal error is indicated. (The printer makes no abnormal noise.) <input type="checkbox"/> When the printer is powered on, the CR motor immediately starts rotating irregularly and a fatal error is indicated. <input type="checkbox"/> When the printer is powered on, the CR does not move at all.	2
The printer feeds paper abnormally.	<input type="checkbox"/> After the power on sequence, the printer attempts to eject a sheet for about 10 seconds and then indicates a paper jam error. <input type="checkbox"/> If the LOAD button is pressed or any paper loading operation is activated after the power on sequence, the printer loads paper from the ASF and then indicates a fatal error. <input type="checkbox"/> If the LOAD button is pressed or any paper loading operation is activated after the power on sequence, the printer indicates a fatal error.	3-1 3-2
Printing is abnormal.	<input type="checkbox"/> No image is printed. <input type="checkbox"/> Faulty printing result (dot missing, uneven printing)	4-1 4-2
The control panel does not function normally.	<input type="checkbox"/> No LEDs on the control panel go on. <input type="checkbox"/> Buttons on the control panel do not function normally. <input type="checkbox"/> Power on button does not work.	5

❑ Flowchart 1: The printer does not operate at all.

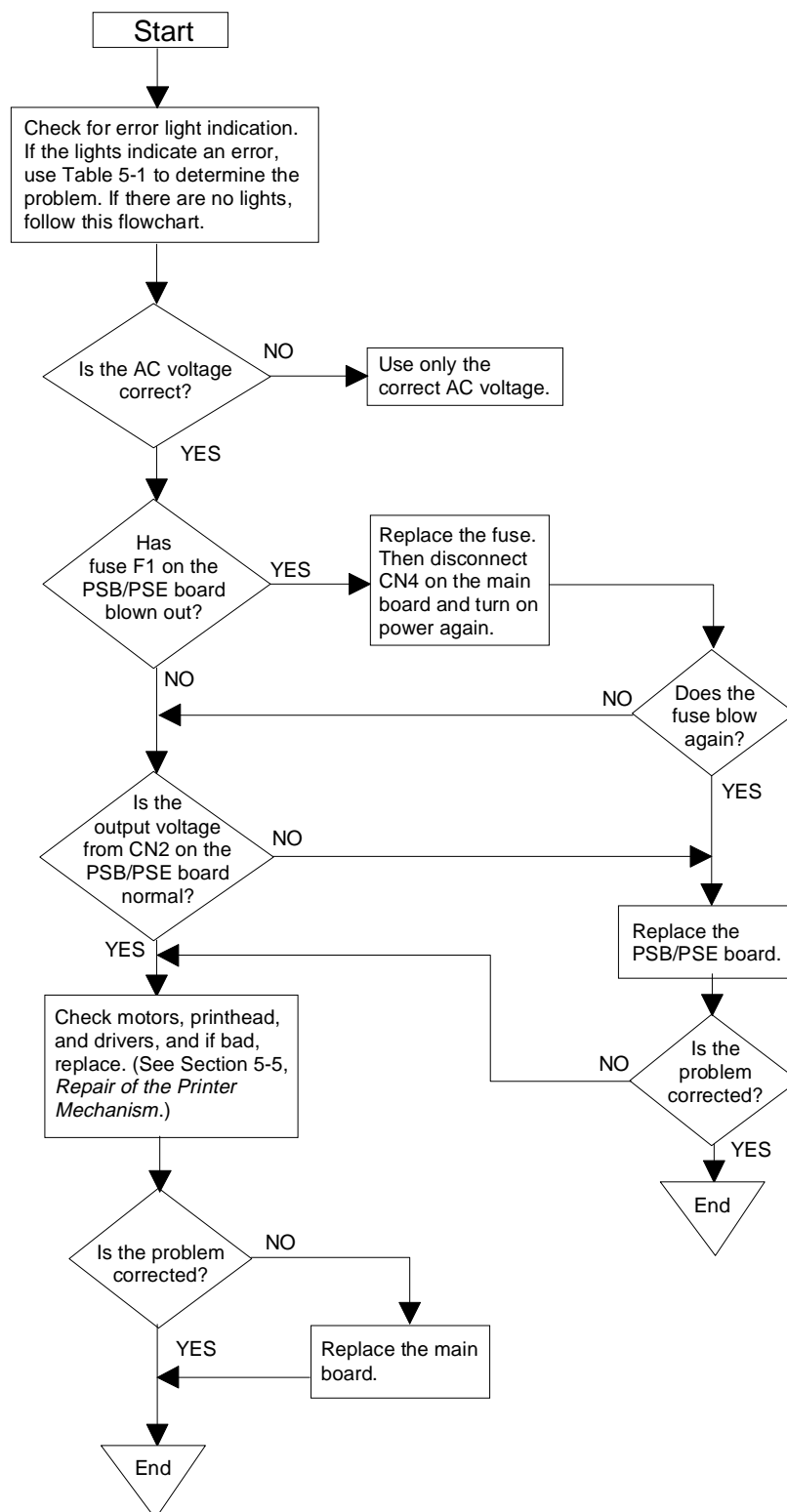


Figure 5-2. Flowchart 1

□ Flowchart 3-1: The printer feeds paper abnormally.

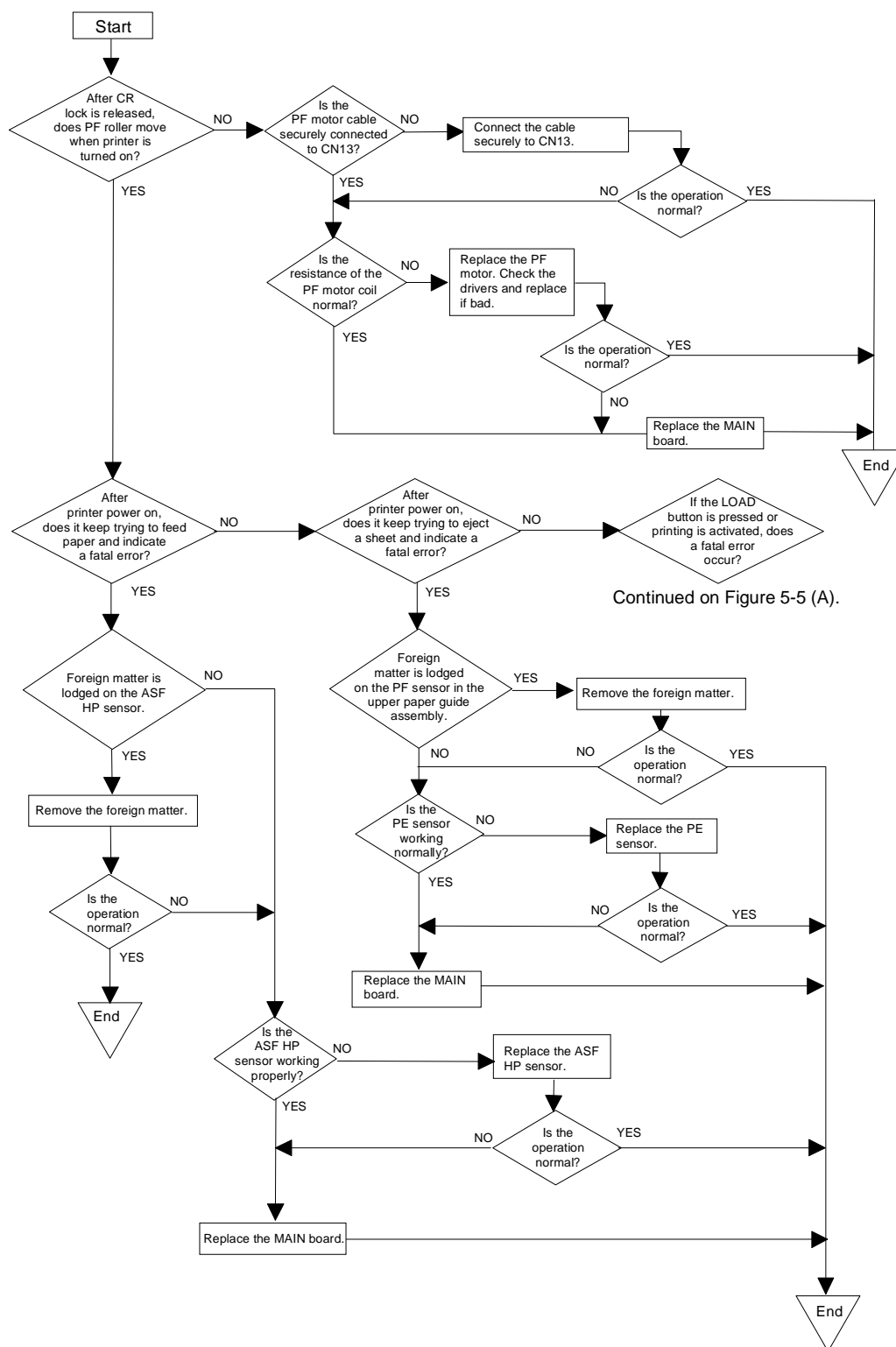


Figure 5-4. Flowchart 3-1

❑ Flowchart 3-2: The printer feeds paper abnormally.

Continued from Figure 5-4.

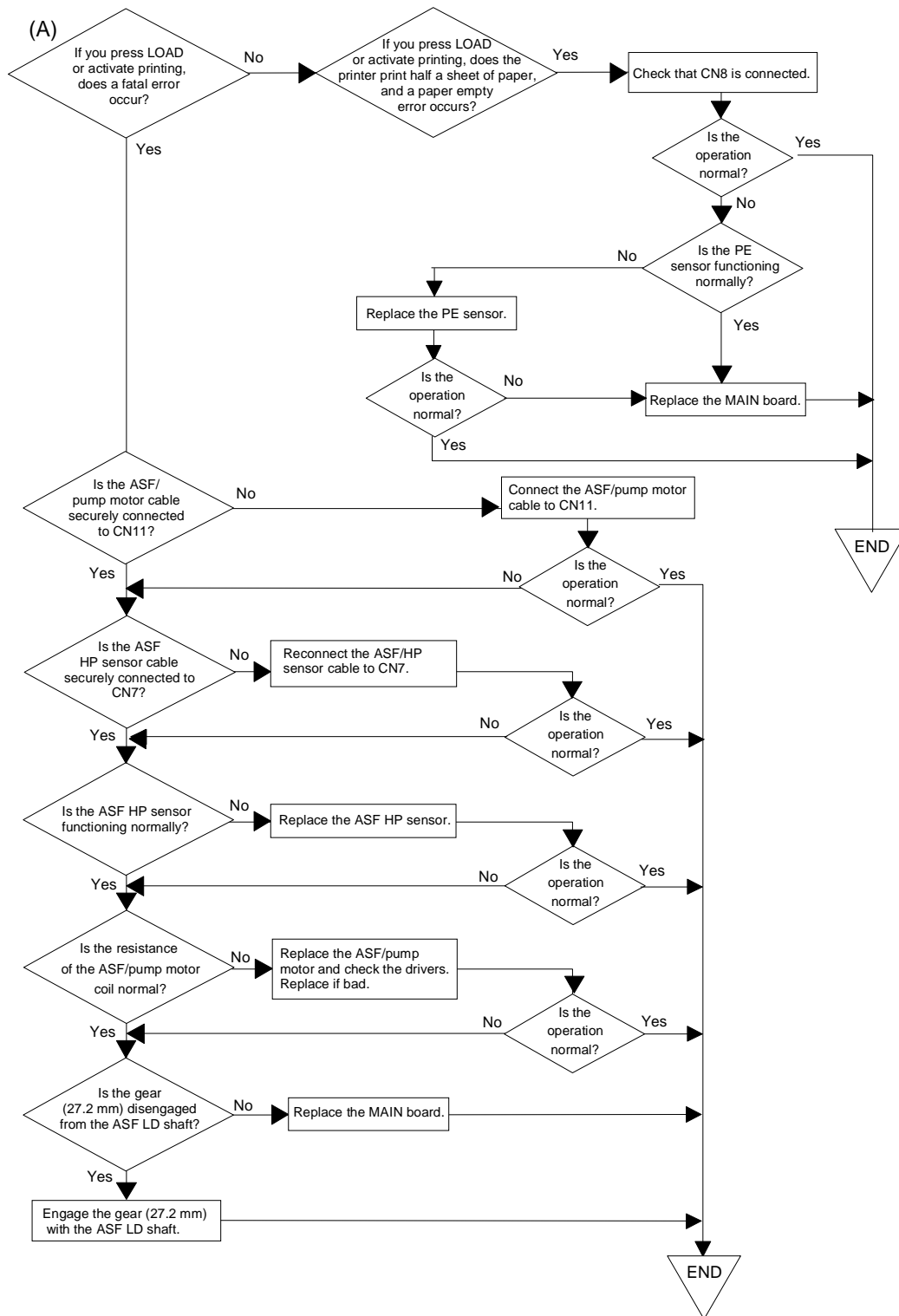


Figure 5-5. Flowchart 3-2

❑ Flowchart 4-1: Printing operation is abnormal.

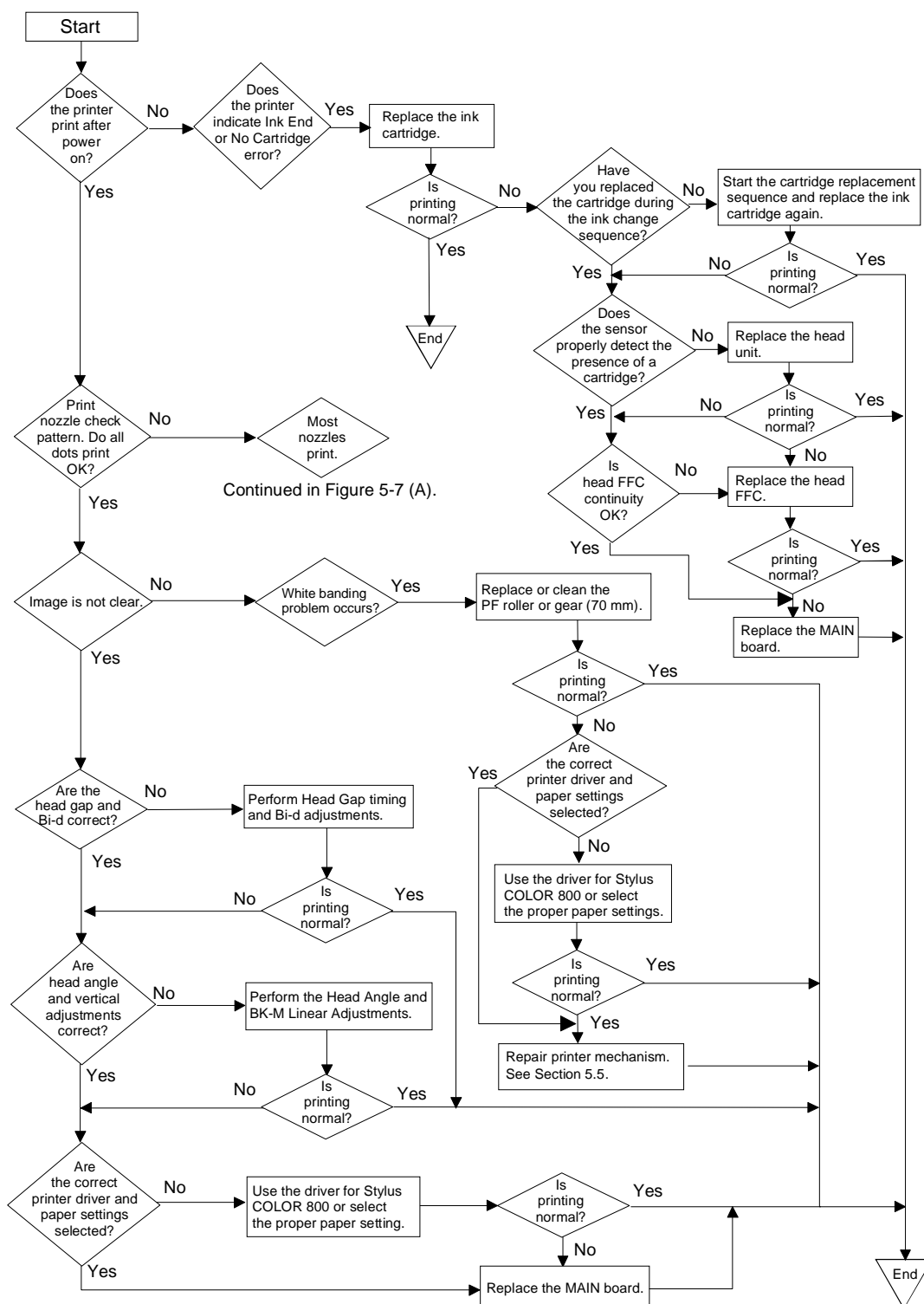


Figure 5-6. Flowchart 4-1

❑ Flowchart 4-2: Printing operation is abnormal.

(A) Continued from Figure 5-6.

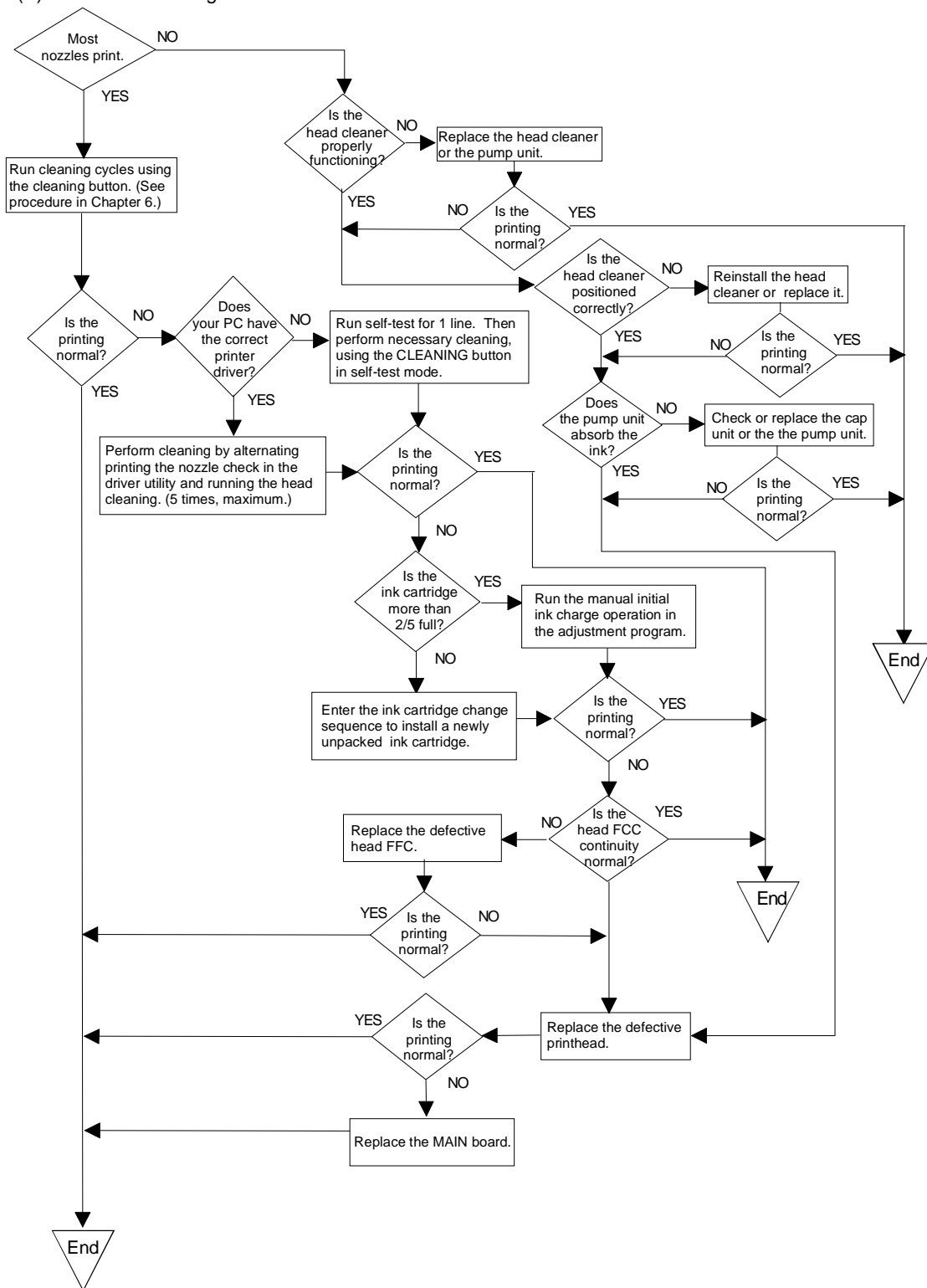


Figure 5-7. Flowchart 4-2

Flowchart 5: .The control panel does not function normally.

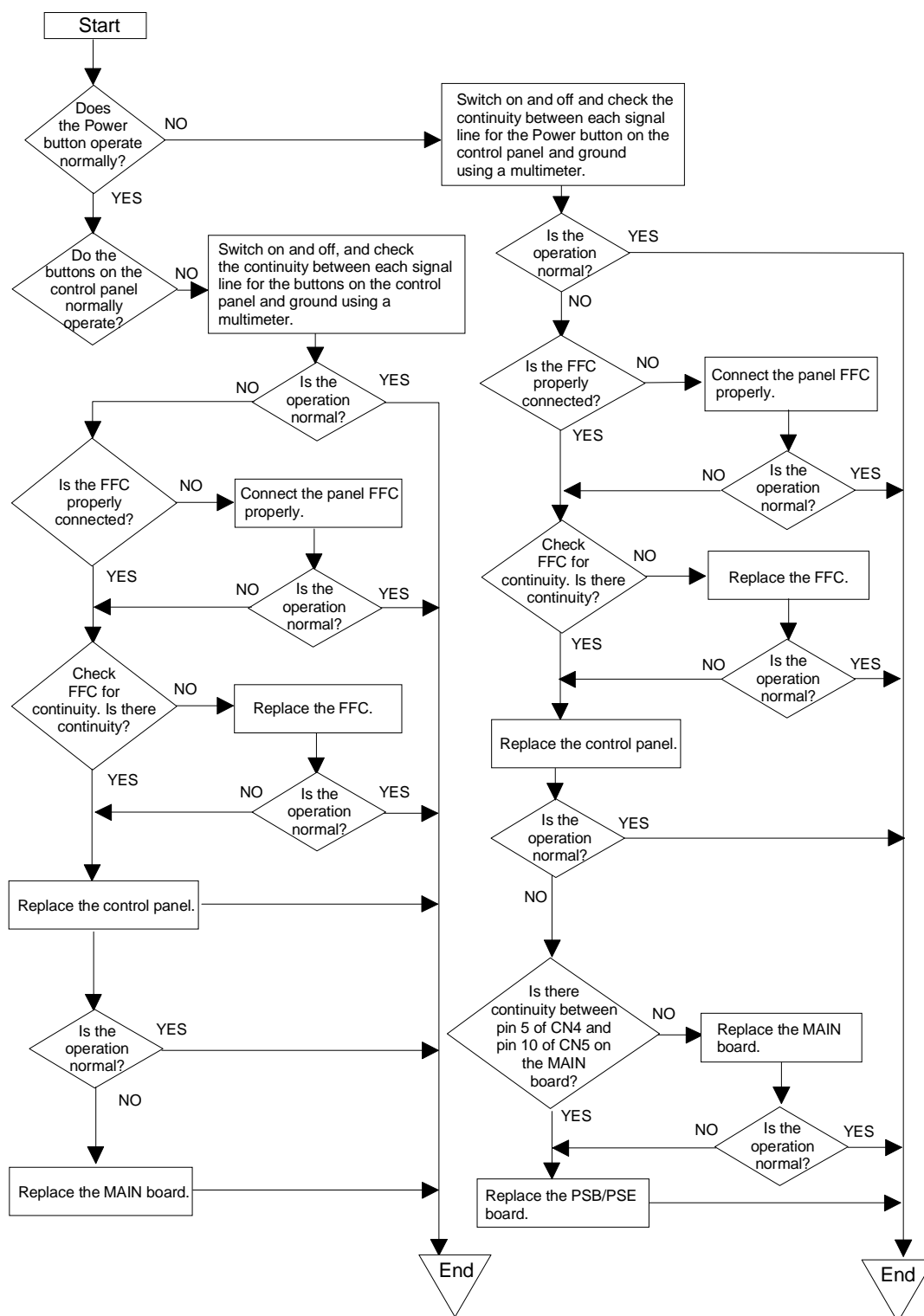


Figure 5-8. Flowchart 5

5.3 Repair of C202 PSB/PSE Board Components

This section describes procedures for replacing and repairing the C202 PSB/PSE board to the component level. Refer to tables 5-5 and 5-6 for symptoms, descriptions, causes, checkpoints, and solutions.

Table 5-5. Repair of C202 PSB/PSE Board Components (1)

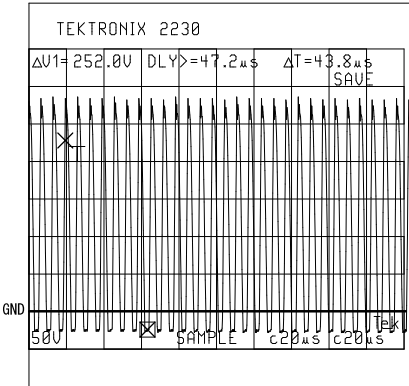
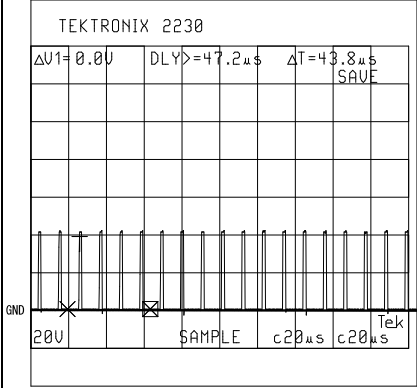
System	Description	Cause	Checkpoints	Solution
The printer does not operate at all.	Neither +45 V nor +5 V is output.	F1 is open.	Check visually if F1 is normal.	Replace F1.
		T1 is open.	Check the voltage output using a meter.	Replace T1.
		Q1 is bad.	<ul style="list-style-type: none"> Check for proper resistance between the source and drain at Q1 FET. Check that the waveform shown below is output from the drain of Q1 FET. 	Replace Q1.
		Q2 is defective.	<ul style="list-style-type: none"> Unplug the AC inlet; then check for proper resistance between the collector and emitter of transistor Q2. Check that Q2 switching is correctly functioning with printer power on. 	Replace Q2, or check if PC1 is functioning.
		Q31 is defective.	<ul style="list-style-type: none"> Unplug the AC inlet; then check for proper resistance between the source and drain of Q31 FET. Check that Q31 FET switching is correctly functioning with printer power on. 	Replace Q31, or check if PC1 is functioning.

Table 5-6. Repair of C202 PSB/PSE Board Components (2)

System	Description	Cause	Checkpoints	Solution
The printer does not operate at all.	Neither +42 V nor +5 V is output.	PC1 is defective.	<ul style="list-style-type: none"> Check for proper resistance between pins 5 and 6 or pins 7 and 8 of PC1. Check the output signal at pin 5 to verify that it alternates from HIGH to LOW. 	Replace the PC1.
	+5 V is not output.	IC51 is defective.	<ul style="list-style-type: none"> Check that the waveform shown below is output from pin 7 of IC51. 	Replace IC51.
		L51 is open.	<ul style="list-style-type: none"> Check resistance between 2 leads of the coil for the L51. 	Replace L51.

5.4 Repair of C202 MAIN Board Components

This section consists of the procedures for replacing and repairing C202 MAIN board to the component level. Refer to Table 5-7, which shows symptoms, descriptions, causes, checkpoints, and solutions.

Table 5-7. Repair of C202 MAIN Board Components (1)

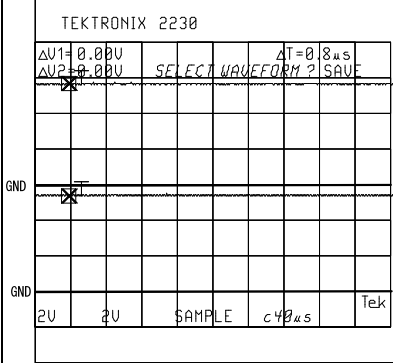
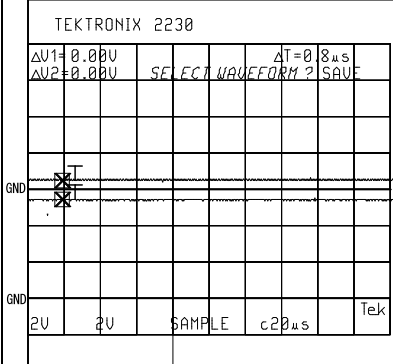
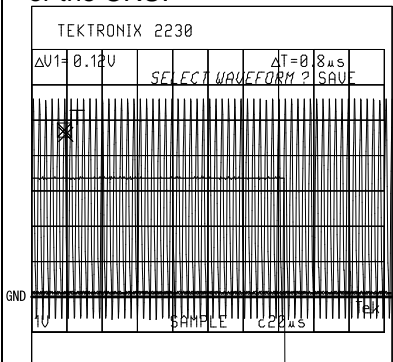
Symptom	Description	Cause	Checkpoints	Solution
The printer does not operate at all.	CPU is not functioning. (The driver mechanism is not functioning correctly when the printer is turned on and off.)	Reset IC for IC9 logic is defective.	<ul style="list-style-type: none"> Check that 5 V is output from pins 1 and 3 of IC9 at a normal state. 	Replace the reset IC for IC9.
		Reset IC for the IC8 42 V line or IC19 is defective.	<ul style="list-style-type: none"> Check that +5 V is output from pin 6 of IC8 and is input to pin 1 of IC19, and 0 V is input to pin 2 of IC19 and +5 V is output from pin 4 of IC19 in a normal state. 	Replace IC8 or IC19.
		CRU1 or CRU2 is defective.	<ul style="list-style-type: none"> Check that the waveform shown below is output from both leads of the CRU. 	Replace the defective CRU.

Table 5-8. Repair of C202 MAIN Board Components (2)

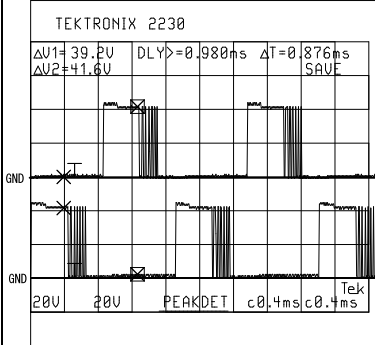
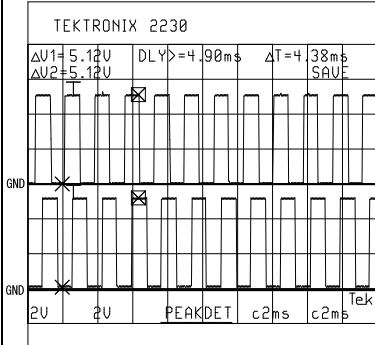
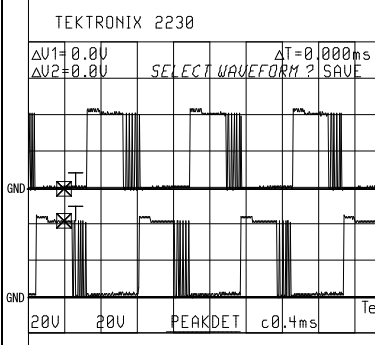
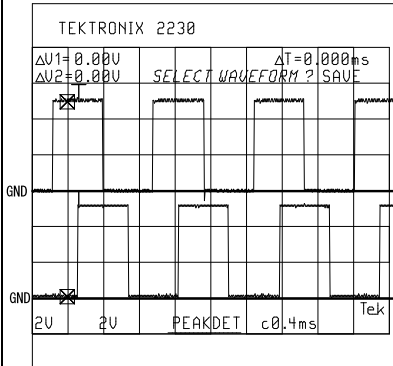
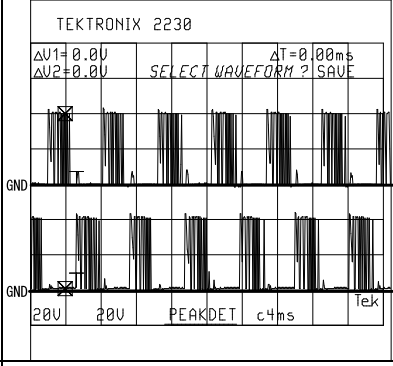
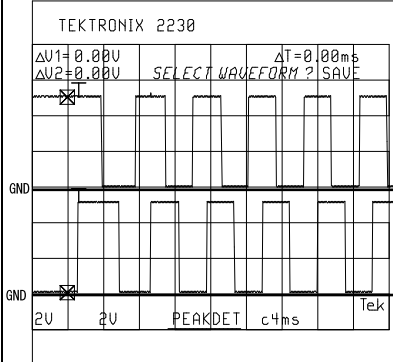
Symptom	Description	Cause	Checkpoints	Solution
CR does not operate properly.	CR does not operate properly.	IC13 or IC2 is defective.	<ul style="list-style-type: none"> Check that the driving waveform for each phase output from IC13 is as shown below. The figure below represents the waveforms for the phase A and phase -A. 	Replace IC13.
		IC1 or IC2 is defective.	<ul style="list-style-type: none"> Check that the CR motor phase changeover waveform output from IC2 to IC13 is as shown below. 	Replace the MAIN board.
Paper is not fed properly.	PF motor does not operate properly.	IC16 or IC2 is defective.	<ul style="list-style-type: none"> Check that the drive waveform for each phase output from the IC16 is as shown below. The figure below represents the waveforms for the phase A and phase -A. 	Replace the IC16.

Table 5-9. Repair of C202 MAIN Board Components (3)

Symptom	Description	Cause	Checkpoints	Solution
Paper is not fed properly.	PF motor does not operate properly.	IC16 or IC2 is defective.	<ul style="list-style-type: none"> Check that the PF motor phase changeover waveform output from IC2 to IC16 is as shown below. 	Replace the MAIN board.
ASF does not load paper, or the pump mechanism is not driven.	ASF / pump motor is not driven properly.	IC6 or IC2 is defective.	<ul style="list-style-type: none"> Check that the drive waveform for each phase output from IC6 is as shown below. The figure below represents the waveforms for the phase A and phase -A. 	Replace IC6.
		IC1 or IC2 is defective.	<ul style="list-style-type: none"> Check that the ASF/pump motor phase changeover waveform output from IC2 to IC6 is as shown below. 	Replace MAIN board.

5.5 Repair of the Printer Mechanism

This section consists of tables containing symptoms, descriptions, possible causes, checkpoints, and solutions you need in troubleshooting problems with units in the printer mechanism.

Table 5-10. Repair of the Printer Mechanism (1)

Symptom	Description	Possible cause	Checkpoints	Solution
CR does not move properly.	A fatal error occurs when the printer is turned on, and CR motor does not rotate. (No abnormal noise.)	The CR motor connector is not properly connected.	Check if the CR motor connector cable is properly connected to CN12.	Connect the CR motor connector cable to CN12.
		CR motor coil is open.	Check CR motor coil resistance, referring to Table 5-3.	Replace the CR motor.
		The timing belt is not engaging the gears.	Check if the timing belt is engaged with the CR pinion gear of the belt pulley.	Reinstall the timing belt or replace it.
	When the printer is turned on, the CR moves away from home position, a fatal error is indicated, and the CR stops. (No abnormal noise.)	HP sensor connector is disconnected.	Check if the HP sensor connector cable is connected to CN6.	Connect the HP sensor connector cable to the CN6.
		Dirt or other foreign matter is lodged between HP sensor terminals.	Check if there is dirt or foreign matter lodged between HP sensor terminals.	Remove foreign substance.
		HP sensor is defective.	Check if the HP sensor is correctly functioning, referring to Table 5-2.	Replace HP sensor.
	When the printer is turned on, you hear a strange noise and a fatal error occurs.	CR lock lever is not released.	1. Check PF motor coil resistance, using Table 5-3. 2. Check if the PF motor connector cable is connected to CN13. 3. Check if anything interferes with CR lock lever movement.	1. Replace PF motor. 2. Connect PF motor connector cable to CN13. 3. Remove the interference.
	When turning on the printer or activating the CR, you hear an abnormal noise and a fatal error is indicated; then the CR stops.	Oil in the CR oil pad has dried up.	Release the CR lock lever with printer power off and check if the CR manually moves smoothly.	Oil the oil pad built in the CR unit. CAUTION: Do not use too much oil, or you could damage the printhead.

Table 5-11. Repair of the Printer Mechanism (2)

Symptom	Description	Possible Cause	Checkpoints	Solution
CR does not move properly.	When the printer is turned on or the CR is activated, you hear a strange noise; a fatal error is indicated; then the CR stops.	Either the sliding part of the CR unit and the top frame are not lubricated or foreign matter is jamming the CR.	Release the CR lock lever with printer power off and check if the CR moves smoothly manually.	Oil the sliding part of the CR unit and the top frame, or remove foreign matter, if found. CAUTION: Do not use too much oil, or you could damage the printhead.
		Foreign matter lodged between CR shaft and CR unit.	Release CR lock lever with power off and check if CR moves smoothly manually.	Replace the CR oil pad. Clean the CR shaft using a soft cloth.
The CR does not move properly.	CR returns to home position, there is a strange noise, and a fatal error is indicated.	Cap in cap assembly does not fit cap frame.	Check whether the cap assembly is properly installed.	Reinstall the cap assembly or replace the cap assembly.
Paper is not fed properly.	PF motor does not rotate at power on. (CR lock lever is not released, there is a strange noise, and a fatal error occurs.)	PF motor connector cable is disconnected.	Check if the PF motor connector cable is connected to CN13.	Connect the PF motor connector cable to CN13.
		PF motor coil is open.	Check PF motor coil resistance using Table 5-3.	Replace PF motor.
	When the printer is turned on, it keeps trying to load paper, and indicates a fatal error.	Foreign matter lodged between ASF HP sensor terminals.	Check if there is foreign matter lodged between ASF HP sensor terminals.	Remove the foreign matter.
		ASF HP sensor is defective.	Check if the ASF HP sensor is properly functioning using Table 5-2.	Replace the ASF HP sensor.
	When the printer is turned on, it keeps trying to load paper; then indicates a paper jam error.	Foreign matter is blocking the PE sensor.	Check if there is foreign matter on the PE sensor lever and rear paper guide.	Remove the foreign substance.
	If you press LOAD or try to print when the printer is turned on, a fatal error occurs.	ASF/pump motor connector cable is disconnected.	Check if the ASF/pump motor connector cable is connected to CN11.	Connect ASF/pump motor connector cable to CN11.
		ASF HP sensor connector cable is disconnected.	Check ASF HP sensor cable is connection to CN7.	Connect ASF HP sensor connector cable to CN7.
		ASF/pump motor coil open.	Check ASF/pump motor coil resistance using Table 5-3.	Replace the ASF/pump motor.

Table 5-12. Repair of the Printer Mechanism (3)

Symptom	Description	Possible cause	Checkpoints	Solution
		Black gear (27.2 mm) on right edge of ASF is disengaged from ASF LD roller shaft	Check if gear (27.2 mm) on the right edge of ASF is engaged with the LD roller shaft.	Reinstall the gear (27.2 mm).
	After power on, printer starts loading paper when you press LOAD or start printing, but loading is not completed, and paper empty error occurs.	PE sensor connector cable is disconnected.	Check if the PE sensor cable is connected to CN8.	Connect the PE sensor cable to CN8.
Paper is not fed properly.	ASF keeps trying to load paper, but paper is not loaded.	ASF LD roller is worn or there is paper dust.	Check the surface of the LD roller.	Clean or replace the LD roller.
	Last sheet of paper in the ASF is not loaded.	The guide sheet is not placed.	Check if the appropriate guide sheet is used.	Use the appropriate guide sheet.
	Transparency sheets not loaded.	Transparency (OHP) adapter is not used.	Check if the adapter is mounted or is correctly used.	Use the OHP adapter correctly.
Abnormal printing	Ink out or ink end occurs when you turn on the printer, but the cartridge is new.	Ink consumption counter not reset when cartridge was replaced during ink cartridge change sequence.		Enter the ink cartridge change sequence again to replace the ink cartridge.
		Ink cartridge sensor defective.	Check sensor, using Table 5-2.	Replace the printhead.
		Head FFC is disconnected.	Check if the head FFC is connected to CN9 or CN10.	Connect the correct FFC to CN9 or CN10.
		Head FFC is damaged.	Check current of pin 1 for each head FFC.	Replace the head FFC.
	All dots or most dots in the nozzle check pattern are not printed.	Bubbles in the cavity.		1. Alternate cleaning and printing. (Printer driver utility is useful.) 2. If ink in cartridge is more than 2/5, run initial ink charge sequence in the adjustment program. 3. Enter ink cartridge change sequence to install a newly unpacked ink cartridge.

Table 5-13. Repair of the Printer Mechanism (4)

Symptom	Description	Possible cause	Checkpoints	Solution
Abnormal printing	You run 5 cleaning cycles (see Chapter 6 for procedure) or install a newly unpacked ink cartridge, but all or most dots are not printed in the nozzle check pattern.	Head FFC is disconnected.	Check if the head FFC is connected to CN9 or CN10.	Connect the correct FFC to the CN9 or CN10.
		Head FFC is damaged.	Check the continuity of each FFC.	Replace the head FFC.
			Check if the head cleaner comes into contact with the head properly.	1. Adjust the head cleaner position. 2. Replace the head cleaner. 3. Adjust the PG.
		Pump unit does not absorb ink.	1. Check if ink tubes are properly connected to the cap assembly. 2. Check if ink tubes are twisted or damaged. 3. Check if the rubber part of the cap assembly is deformed. 4. Check if the air valve in the cap assembly is damaged. 5. Perform the pump check procedure given at the end of this chapter.	1. Connect the ink tubes to the cap assembly properly. 2. Replace the ink tubes or the pump unit. 3. Replace the cap assembly. 4. Replace the air valve or the cap assembly. 5. See page 5-22.
		Printhead is defective.	(If the problem still occurs after verifying all checkpoints mentioned above.)	Replace the printhead.
	White banding appears.	Dot missing	Check the nozzle condition by performing nozzle check.	Refer to the solution described in the previous page.
		PF roller is worn or is smudged with the ink.	Check the surface of the PF roller.	Clean the PF roller surface or replace the PF roller.

Table 5-14. Repair of the Printer Mechanism (5)

Symptom	Description	Possible cause	Checkpoints	Solution
		Some gear teeth broke or the gear (70 mm) does not engage the PF roller shaft properly.	Check the teeth of the gear (70 mm). Check if the gear (70 mm) rotates constantly with the torque from the PF motor.	Replace the gear (70 mm) or reinstall the gear (70 mm) properly.
		The driven roller on the upper paper guide is worn or the torsion spring (117.6 g) lacks sufficient tension.	Check if the surface of the driven roller on the upper paper guide is blackish or is covered with foreign matter. Check if the torsion spring is bent or hooked securely.	Replace the driven roller or the torsion spring. Remove the foreign matter from the surface of the driven roller.
	Image is not clear.	Head gap or Bi-d is not adjusted adequately.	Check the head gap and Bi-d status by using the printer driver utility, adjust program, or control panel.	Perform adjustment using the adjusting utilities and programs.
Abnormal printing	Image is not clear.	Head angular or head vertical position is not adjusted properly.	Refer to 4-12 and 4-15 in Chapter 4.	Refer to 4-12 and 4-15 in Chapter 4.
		PG is too wide.	Check the position of the PG lever.	Set the lever to "0".
		Dot missing	Check if the nozzles are clogged by performing nozzle check.	Refer to the corresponding solution on the previous page.
	Ink smudges.	There is ink on the driven roller, upper paper guide, or other parts of the paper path	Feed a sheet of plain paper, and check if it is smudged.	Clean the part covered with ink.
		The platen gap is too narrow, or the paper loaded does not meet specifications.	Check the position of the PF lever. Check paper thickness.	Set the PG lever to "+." Use only paper within specifications given in Chapter 1.

5.6 Pump Check Procedure

When you encounter missing dots in the printout, and you have run cleaning cycles and the initial ink charge sequence without success, try the following procedure to check the pump and clear the nozzles:

1. Turn the printer off.
2. Move the printhead manually to the right until you hear the click that means the carriage lock is disengaged.
3. Then slide the carriage assembly left enough to see the capping mechanism.
4. Using a dropper (or straw) place several drops of warm water into the capping mechanism.
5. Turn the printer back on. The carriage moves back to the home position, and the printhead is above capping mechanism.
6. Follow the procedure in Chapter 3, *Disassembly* to remove the printer mechanism.
7. Turn the printer on and see if water flows through the tubes to the waste ink pads. If water does not flow through the tubes:
 - ☐ Check for twisted or damaged tubes.
 - ☐ Check if ink tubes are properly connected.
 - ☐ Check if the rubber part of the cap assembly is damaged.
 - ☐ Check if the air valve in the cap assembly is damaged.
 - ☐ If everything with the tubes is OK, replace the pump mechanism.
8. Reassemble the printer and run another cleaning cycle.